

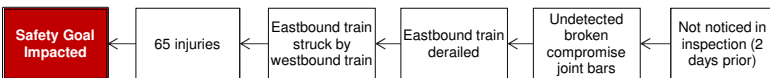
# 1 Problem

<b>What</b>	Problem(s)	Accidents involving metro system	
<b>When</b>	Date	May 2013 to May 2014	
	Time	See timeline	
<b>Where</b>	Different, unusual, unique	Recurring safety issues	
	Facility, site	New York and Connecticut	
	Unit, area, equipment	Metro-North	
	Task being performed	Railroad operations	
<b>Impact to the Goals</b>	<b>Public Safety</b>	4 customer fatalities; 126 injuries	
	<b>Employee Safety</b>	2 workers killed	
	<b>Property/ Equipment</b>	Property damage	\$28.3 M
	<b>Regulatory</b>	NSTB special investigation	
	Frequency	These incidents	\$28.3 M
	Annualized Cost	>\$28.3 M	
		5 incidents within 11 months	

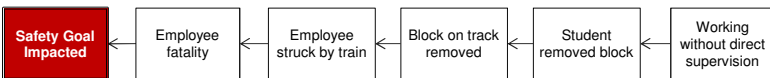
# 2 Analysis

**Basic Level Cause Maps** - Start with simple Why questions.

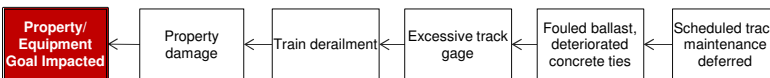
## May 17, 2013 Train Derailment and Collision



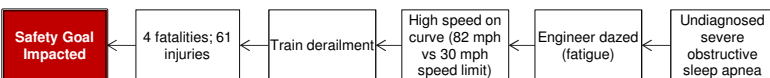
## May 28, 2013 Employee Struck by Train



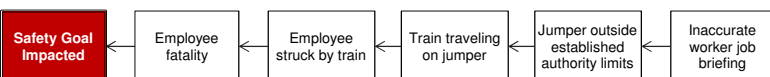
## July 18, 2013 Train Derailment



## December 1, 2013 Train Derailment



## March 10, 2014 Employee Struck by Train



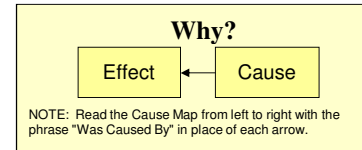
# SAFETY CONCERNS RAISED BY 5 ACCIDENTS IN 11 MONTHS

Cause Map

## 4 fatalities, 126 injuries and \$28.3M in property damage result

"Seeing this pattern of safety issues in a single railroad is troubling. The NTSB has made numerous recommendations to the railroad and the regulator that could have prevented or mitigated these accidents. But recommendations can only make a difference if the recipients of our recommendations act on them."

- NTSB Acting Chairman Christopher A. Hart



For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.

**ThinkReliability**

Investigate Problems. Prevent Problems.  
Houston, Texas 281-412-7766 ThinkReliability.com

Copyright ThinkReliability 2014

Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

## CAUSE MAPPING

Problem Solving • Incident Investigation • Root Cause Analysis

- Step 1 **Problem** What's the Problem?
- Step 2 **Analysis** Why did it happen?
- Step 3 **Solutions** What will be done?

**Cumulative Cause Maps** - Add detail as information becomes available.

